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# Deer Creek Reservoir Wasatch County, Utah

National Eutrophication Survey, Corvallis, Oreg

Prepared for

Corvallis Environmental Research Lab, Oreg

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# U.S. ENVIRONMENTAL PROTECTION AGENCY
# NATIONAL EUTROPHICATION SURVEY

## WORKING PAPER SERIES

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# Report
# on
# Deer Creek Reservoir
# Wasatch County
# Utah
# EPA Region VIII
# Working Paper No. 837

With the cooperation of the
Utah State Division of Health
and the
Utah National Guard
October, 1977

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16. ABSTRACT
Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

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17. KEY WORDS AND DOCUMENT ANALYSIS

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|---|---|---|
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# FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

## OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

## ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

## LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGEMENT

The staff of the National Eutrophication Survey (Office of Research and Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the Utah Department of Social Services and the Utah Department of Natural Resources for professional involvement, to the Utah National Guard for conducting the tributary sampling phase of the Survey, and to those Utah wastewater treatment plant operators who voluntarily provided effluent samples and flow data.

The staffs of the Bureau of Water Quality of the Division of Health and the Division of Wildlife Resources provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary reports, and provided critiques most useful in the preparation of this Working Paper series.

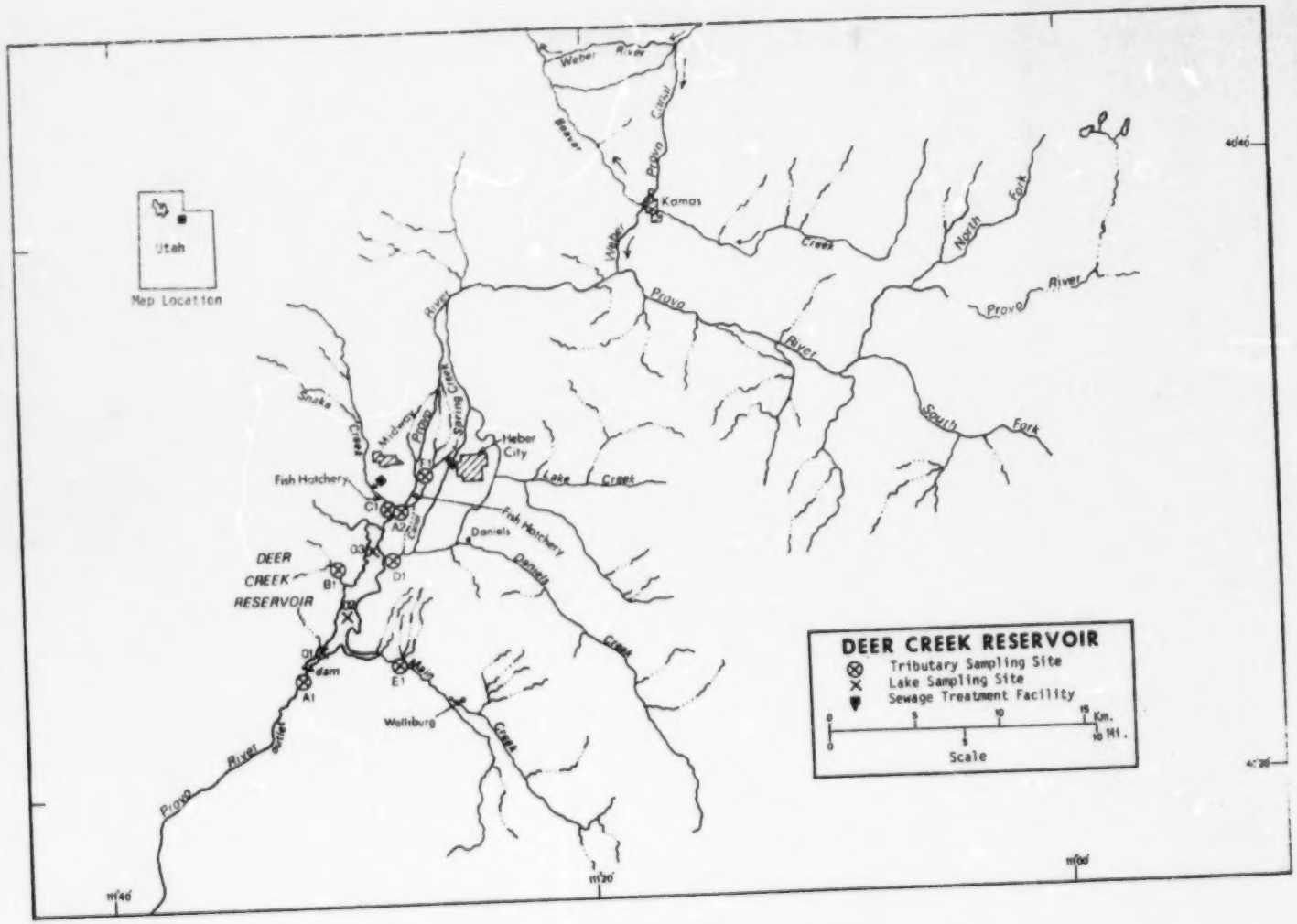
Major General Maurice L. Watts, the Adjutant General of Utah, and Project Officer Lt. Colonel T. Ray Kingston, who directed the volunteer efforts of the Utah National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES AND RESERVOIRS

## STATE OF UTAH

| NAME | COUNTY |
|---|---|
| Bear | Rich, UT; Bear Lake, ID |
| Deer Creek | Wasatch |
| Echo | Summit |
| Fish | Sevier |
| Flaming Gorge | Daggett, UT; Sweetwater, WY |
| Huntington | Emery |
| Joes Valley | Emery |
| Lower Bowns | Garfield |
| Lynn | Box Elder |
| Minersville | Beaver |
| Moon | Duchesne |
| Navajo | Kane |
| Newcastle | Iron |
| Otter Creek | Piute |
| Panguich | Garfield |
| Pelican | Uintah |
| Pineview | Weber |
| Piute | Piute |
| Porcupine | Cache |
| Powell | Garfield, Kane, San Juan, UT; Coconino, AZ |
| Pruess | Millard |
| Sevier Bridge | Juab, Sanpete |
| Starvation | Duchesne |
| Steinaker | Uintah |
| Tropic | Garfield |
| Utah | Utah |
| Willard Bay | Box Elder |


Utah
Map Location
Weber River
Beaver
Provo
Canal
Kamas
Weber
River
Provo
River
North Fork
Provo River
South Fork
Creek
Snake
Creek
Provo
River
Spring
Creek
Heber
City
Lake
Creek
Fish Hatchery
C1
A2
Creek
Daniels
Fish Hatchery
Daniels
Creek
DEER
CREEK
RESERVOIR
B1
D1
D2
dam
A1
E1
Main
Creek
Provo
River
Outlet
Wallsburg
DEER CREEK RESERVOIR
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
0
5
10
15 Km.
0
5
10 Mi.
Scale
m'46
m'20
m'00
4'46
4'26

DEER CREEK RESERVOIR

STORET NO. 4903

## I. CONCLUSIONS

### A. Trophic Condition:

Survey data indicate that Deer Creek Reservoir is eutrophic. It ranked twentieth in overall trophic quality among the 27 Utah lakes and reservoirs sampled in 1975 when compared using a combination of six water quality parameters*. Fifteen of the water bodies had less median total phosphorus, ten had less and three had the same median dissolved orthophosphorus, 21 had less median inorganic nitrogen, 17 had less mean chlorophyll a, and 15 had greater mean Secchi disc transparency. Marked depression of dissolved oxygen with depth occurred at sampling station 1 in August and September.

Survey limnologists noted submerged macrophytes near the shoreline in August and clumps of algae at the surface in September, particularly at sampling station 3.

### B. Rate-Limiting Nutrient:

The algal assay results indicate phosphorus limitation at the times the samples were collected (05/12/75 and 09/19/75). The reservoir data also indicate phosphorus limitation in May and September but nitrogen limitation at two of the three sampling stations in August.

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* See Appendix A.

C. Nutrient Controllability:

1. Point sources--During the sampling year, point sources contributed 48.5% of the total phosphorus input to Deer Creek Reservoir. The wastewater treatment facilities at Midway and Heber City accounted for 6.2% and 24.7%, respectively. The Clearview Trout Farm added 2.9%, and the Midway Fish Hatchery contributed 14.7%; however, the proportion of these loads attributable to the hatchery operations is not known since the quality of the waters entering the hatcheries was not measured.

The present phosphorus loading of 2.47 $g/m^2$/year is 2.2 times that proposed by Vollenweider (Vollenweider and Dillon, 1974) as a eutrophic loading (see page 13). Because the reservoir is phosphorus limited much of the time, all phosphorus inputs should be minimized to the greatest practicable degree. It is calculated that the present phosphorus loading would have to be reduced 55% to achieve a level equal to the proposed eutrophic loading.

2. Non-point sources--Non-point sources accounted for 51.5% of the total phosphorus load during the sampling year. The Provo River contributed 37.8%, and three other gaged tributaries collectively contributed 11.3%. The ungaged minor tributaries and immediate drainage accounted for an estimated 1.7% of the total load.

## II. RESERVOIR AND DRAINAGE BASIN CHARACTERISTICS†

### A. Morphometry††:

1. Surface area: 9.66 kilometers$^2$.
2. Mean depth: 19.9 meters.
3. Maximum depth: 41.8 meters.
4. Volume: 192.301 x $10^6$ $m^3$.
5. Mean hydraulic retention time: 211 days (based on outflow).

### B. Tributary and Outlet:
(See Appendix C for flow data)

1. Tributaries -

| Name | Drainage area ($km^2$)* | Mean flow ($m^3$/sec)* |
|---|---|---|
| Provo River (includes area & flow of Spring Creek) | 976.4 | 8.230 |
| Decker Creek | 4.7 | 0.011 |
| Snake Creek | 82.9 | 1.300 |
| Daniels Creek | 126.9 | 0.100 |
| Main Creek | 186.5 | 0.375 |
| (Spring Creek) | (150.2) | (0.510) |
| Minor tributaries & immediate drainage - | 63.3 | 0.660 |
| Totals | 1,440.7 | 10.676 |

2. Outlet -

| | | |
|---|---|---|
| Provo River | 1,450.4** | 10.540 |

### C. Precipitation***:

1. Year of sampling: 123.1 centimeters.
2. Mean annual: 110.0 centimeters.

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† Table of metric conversions--Appendix B.
†† Sudweeks, 1975; max. depth from Ikner (1974).
* For limits of accuracy, see Working Paper No. 175, "...Survey Methods, 1973-1976".
** Includes area of reservoir.
*** See Working Paper No. 175.

## III. WATER QUALITY SUMMARY

Deer Creek Reservoir was sampled three times during the open-water season of 1975 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from a number of depths at three stations on the reservoir (see map, page v). During each visit, a single depth-integrated (4.6 m or near bottom to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the first and last visits, a single 18.9-liter depth-integrated sample was composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll *a* analysis. The maximum depths sampled were 35.1 meters at station 1, 24.4 meters at station 2, and 5.5 meters at station 3.

The sampling results are presented in full in Appendix D and are summarized in the following table.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR DEER CREEK RESERVOIR
STORET CODE 4903

| | 1ST SAMPLING ( 5/12/75) | | | 2ND SAMPLING ( 8/11/75) | | | 3RD SAMPLING ( 9/19/75) | | |
|---|---|---|---|---|---|---|---|---|---|
| | 3 SITES | | | 3 SITES | | | 3 SITES | | |
| PARAMETER | RANGE | MEAN | MEDIAN | RANGE | MEAN | MEDIAN | RANGE | MEAN | MEDIAN |
| TEMP (C) | 5.0 - 9.5 | 7.6 | 8.2 | 12.7 - 23.8 | 19.8 | 22.4 | 13.3 - 18.8 | 17.6 | 18.2 |
| DISS OXY (MG/L) | 8.6 - 11.0 | 9.7 | 9.7 | 2.6 - 9.0 | 6.1 | 6.7 | 0.2 - 10.4 | 6.7 | 8.0 |
| CNDCTVY (MCROMO) | 294. - 316. | 306. | 307. | 218. - 333. | 283. | 297. | 223. - 338. | 298. | 303. |
| PH (STAND UNITS) | 8.3 - 8.7 | 8.5 | 8.5 | 7.8 - 9.4 | 8.5 | 8.4 | 7.5 - 8.8 | 8.2 | 8.3 |
| TOT ALK (MG/L) | 136. - 149. | 144. | 145. | 106. - 126. | 115. | 115. | 120. - 158. | 143. | 145. |
| TOT P (MG/L) | 0.027 - 0.054 | 0.040 | 0.042 | 0.020 - 0.089 | 0.040 | 0.040 | 0.014 - 0.285 | 0.055 | 0.035 |
| ORTHO P (MG/L) | 0.006 - 0.021 | 0.012 | 0.012 | 0.002 - 0.058 | 0.017 | 0.006 | 0.002 - 0.069 | 0.010 | 0.004 |
| NO2+NO3 (MG/L) | 0.180 - 0.270 | 0.213 | 0.200 | 0.020 - 0.390 | 0.170 | 0.080 | 0.030 - 0.440 | 0.159 | 0.140 |
| AMMONIA (MG/L) | 0.030 - 0.180 | 0.071 | 0.040 | 0.020 - 0.040 | 0.022 | 0.020 | 0.020 - 0.270 | 0.044 | 0.020 |
| KJEL N (MG/L) | 0.300 - 0.600 | 0.464 | 0.450 | 0.200 - 0.500 | 0.329 | 0.350 | 0.200 - 0.800 | 0.406 | 0.400 |
| INORG N (MG/L) | 0.210 - 0.450 | 0.284 | 0.230 | 0.040 - 0.410 | 0.192 | 0.110 | 0.050 - 0.510 | 0.203 | 0.160 |
| TOTAL N (MG/L) | 0.500 - 0.870 | 0.677 | 0.675 | 0.220 - 0.670 | 0.499 | 0.505 | 0.380 - 1.040 | 0.566 | 0.530 |
| CHLRPYL A (UG/L) | 4.3 - 9.3 | 7.4 | 8.5 | 1.3 - 1.5 | 1.4 | 1.3 | 11.6 - 25.2 | 18.5 | 18.7 |
| SECCHI (METERS) | 1.1 - 1.8 | 1.5 | 1.8 | 1.5 - 2.1 | 1.9 | 2.1 | 0.9 - 2.7 | 1.8 | 1.8 |

B. Biological Characteristics:

1. Phytoplankton -

| Sampling Date | Dominant Genera | Algal Units per ml |
|---|---|---|
| 05/12/75 | 1. Stephanodiscus sp. | 5,047 |
| | 2. Chroomonas sp. | 3,426 |
| | 3. Flagellates | 2,100 |
| | 4. Cryptomonas sp. | 700 |
| | 5. Asterionella sp. | 74 |
| | Total | 11,347 |
| 08/11/75 | 1. Fragilaria sp. | 7,571 |
| | 2. Sphaerocystis sp. | 55 |
| | Total | 7,626 |
| 09/19/75 | 1. Aphanizomenon sp. | 2,365 |
| | 2. Chroomonas sp. | 377 |
| | 3. Flagellates | 240 |
| | 4. Stephanodiscus sp. | 69 |
| | 5. Coelosphaerium sp. | 69 |
| | Other genera | 102 |
| | Total | 3,222 |

2. Chlorophyll a -

| Sampling Date | Station Number | Chlorophyll a (µg/l) |
|---|---|---|
| 05/12/75 | 1 | 8.5 |
| | 2 | 9.3 |
| | 3 | 4.3 |
| 08/11/75 | 1 | 1.5 |
| | 2 | 1.3 |
| | 3 | 1.3 |
| 09/19/75 | 1 | 11.6 |
| | 2 | 18.7 |
| | 3 | 25.2 |

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

a. May sample -

| Spike (mg/l) | Ortho P Conc. (mg/l) | Inorganic N Conc. (mg/l) | Maximum yield (mg/l-dry wt.) |
|---|---|---|---|
| Control | 0.015 | 0.299 | 3.3 |
| 0.050 P | 0.065 | 0.299 | 11.7 |
| 0.050 P + 1.0 N | 0.065 | 1.299 | 20.5 |
| 1.0 N | 0.015 | 1.299 | 2.0 |

b. September sample -

| Spike (mg/l) | Ortho P Conc. (mg/l) | Inorganic N Conc. (mg/l) | Maximum yield (mg/l-dry wt.) |
|---|---|---|---|
| Control | 0.010 | 0.185 | 1.0 |
| 0.050 P | 0.060 | 0.185 | 7.1 |
| 0.050 P + 1.0 N | 0.060 | 1.185 | 22.3 |
| 1.0 N | 0.010 | 1.185 | 1.0 |

2. Discussion -

The control yields of the assay alga, Selenastrum capricornutum, indicate the potential primary productivity of Deer Creek Reservoir was moderately high at the times the samples were collected. Also, in both assays the significant increase in yields with the addition of phosphorus alone indicates the reservoir was limited by phosphorus at those times. Note that the addition of nitrogen alone in both assays resulted in yields no greater than those of the controls.

The reservoir data indicate phosphorus limitation in May and September as well; i.e., the mean inorganic nitrogen/ortho-

phosphorus ratios were 16/1 or greater at all stations in May and 13/1 or greater at all stations in September. However, nitrogen limitation is indicated at two of the three stations in August; i.e., the mean N/P ratios were 9/1 at station 1 and 5/1 at station 3. The mean N/P ratio was 21/1 at station 2 in August, and phosphorus limitation would be expected.

## IV. NUTRIENT LOADINGS
(See Appendix E for data)

For the determination of nutrient loadings, the Utah National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the high runoff months of May and June when two samples were collected. Sampling was begun in November, 1974, and was completed in October, 1975.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Utah District Office of the U.S. Geological Survey for the tributary sites nearest the reservoir.

Except for Snake and Decker creeks, nutrient loads for sampled tributaries were determined by using a modification of a U.S. Geological Survey computer program for calculating stream loadings*. Nutrient loads shown are those measured minus point-source loads, if any.

The combined nutrient loads of the Midway wastewater treatment plant and the Midway Fish Hatchery exceeded the loads measured in Snake Creek at station C-1; and, although Decker Creek was sampled nine times at station B-1, most of the flows were too low to be measured accurately. Therefore, the loads for these streams and the unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the means of the nutrient loads, in $kg/km^2/year$, at stations D-1 and E-1 and multiplying the means by the B-1, C-1, and ZZ areas in $km^2$.

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* See Working Paper No. 175.

Also, the nutrient loads measured in Spring Creek at station F-1 are included in the Provo River loads at station A-2 and, hence, are not listed separately in the loading tables that follow.

The operators of the Heber City and Midway wastewater treatment plants provided monthly effluent samples and corresponding flow data, and the personnel of Clearview Trout Farm and the Midway Fish Hatchery provided monthly discharge samples and corresponding flows.

A. Waste Sources*:

1. Known municipal -

| Name | Pop. Served | Treatment | Mean Flow ($m^3/d$) | Receiving Water |
|---|---|---|---|---|
| Heber City | 3,000 | tr. filter | 9,490.0 | Spring Creek/ Provo River |
| Midway | 1,000 | tr. filter | 1,106.9 | Snake Creek |

2. Known industrial - None

3. Fish hatcheries -

| Name | Type Waste | Treatment | Mean Flow ($m^3/d$) | Receiving Water |
|---|---|---|---|---|
| Clearview Trout Farm | fish propagation | none | 11,255.3 | Provo River |
| Midway Fish Hatchery | fish propagation | none | 76,200.2 | Snake Creek |

* Hopkins and Hinshaw, 1974.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

| Source | kg P/ yr | % of total |
|---|---|---|
| a. Tributaries (non-point load) - | | |
| Provo River | 9,005 | 37.8 |
| Decker Creek | 30 | 0.1 |
| Snake Creek | 540 | 2.3 |
| Daniels Creek | 760 | 3.2 |
| Main Creek | 1,380 | 5.8 |
| b. Minor tributaries & immediate drainage (non-point load) - | 410 | 1.7 |
| c. Known municipal STP's - | | |
| Heber City | 5,875 | 24.6 |
| Midway | 1,485 | 6.2 |
| d. Septic tanks - Unknown | ? | - |
| e. Known industrial - None | - | - |
| f. Fish hatcheries - | | |
| Clearview Trout Farm | 695 | 2.9 |
| Midway Fish Hatchery | 3,500 | 14.7 |
| g. Direct precipitation* - | 170 | 0.7 |
| Total | 23,850 | 100.0 |

2. Outputs -

Lake outlet - Provo River 15,605

3. Net annual P accumulation - 8,245 kg.

* See Working Paper No. 175.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

| Source | kg N/yr | % of total |
|---|---|---|
| a. Tributaries (non-point load) - | | |
| Provo River | 199,385 | 64.0 |
| Decker Creek | 240 | 0.1 |
| Snake Creek | 4,270 | 1.4 |
| Daniels Creek | 4,405 | 1.4 |
| Main Creek | 12,655 | 4.1 |
| b. Minor tributaries & immediate drainage (non-point load) - | 3,260 | 1.0 |
| c. Known municipal STP's - | | |
| Heber City | 25,030 | 8.0 |
| Midway | 4,680 | 1.5 |
| d. Septic tanks - Unknown | ? | - |
| e. Known industrial - None | - | - |
| f. Fish hatcheries - | | |
| Clearview Trout Farm | 6,190 | 2.0 |
| Midway Fish Hatchery | 40,810 | 13.1 |
| g. Direct precipitation* - | 10,430 | 3.3 |
| Total | 311,355 | 100.0 |

2. Outputs -

Lake outlet - Provo River 242,720

3. Net annual N accumulation - 68,635 kg.

D. Non-point Nutrient Export by Subdrainage Area:

| Tributary | kg P/km²/yr | kg N/km²/yr |
|---|---|---|
| Provo River | 9 | 204 |
| Daniels Creek | 6 | 35 |
| Main Creek | 7 | 68 |

* See Working Paper No. 175.

E. Mean Nutrient Concentrations in Estimated or Unlisted Streams:

| Tributary | Mean Total P Conc. (mg/l) | Mean Total N Conc. (mg/l) |
|---|---|---|
| Decker Creek | 0.059 | 0.324 |
| Snake Creek | 0.090 | 1.282 |
| Spring Creek | 0.300 | 1.492 |

F. Yearly Loads:

In the following table, the existing phosphorus loadings are compared to those proposed by Vollenweider (Vollenweider and Dillon, 1974). Essentially, his "dangerous" loading is one at which the receiving water would become eutrophic or remain eutrophic; his "permissible" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic loading would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with short hydraulic retention times.

| | Total Phosphorus | | Total Nitrogen | |
|---|---|---|---|---|
| | Total | Accumulated | Total | Accumulated |
| grams/$m^2$/yr | 2.47 | 0.85 | 32.2 | 7.1 |

Vollenweider phosphorus loadings ($g/m^2/yr$) based on mean depth and mean hydraulic retention time of Deer Creek Reservoir:

| | |
|---|---|
| "Dangerous" (eutrophic loading) | 1.12 |
| "Permissible" (oligotrophic loading) | 0.56 |

## V. LITERATURE REVIEWED

Anderson, Donald R., John A. Dracup, Thomas J. Fogarty, and Robert Willis; 1976. Water quality modeling of deep reservoirs. Jour. Water Poll. Contr. Fed. 48 (1): 134-146.

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Sudweeks, Calvin K., 1974. Personal communication (reservoir morphometry). UT Bur. of Env. Health, Salt Lake City.

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# VI. APPENDICES

## APPENDIX A

## LAKE RANKINGS

LAKE DATA TO BE USED IN RANKINGS

| LAKE CODE | LAKE NAME | MEDIAN TOTAL P | MEDIAN INORG N | 500-MEAN SEC | MEAN CHLORA | 15-MIN DO | MEDIAN DISS ORTHO P |
|---|---|---|---|---|---|---|---|
| 0408 | LAKE POWELL | 0.010 | 0.410 | 339.830 | 3.081 | 13.800 | 0.007 |
| 4901 | BEAR LAKE | 0.011 | 0.040 | 253.167 | 0.945 | 9.200 | 0.003 |
| 4902 | LOWER BOWN'S RESERVOIR | 0.031 | 0.040 | 336.000 | 5.567 | 9.400 | 0.006 |
| 4903 | DEER CREEK RESERVOIR | 0.038 | 0.215 | 430.333 | 9.078 | 14.800 | 0.006 |
| 4904 | ECHO RESERVOIR | 0.047 | 0.170 | 450.333 | 6.967 | 14.000 | 0.012 |
| 4905 | LYNN RESERVOIR | 0.121 | 0.200 | 417.667 | 39.600 | 10.400 | 0.052 |
| 4906 | FISH LAKE | 0.023 | 0.040 | 152.000 | 12.483 | 10.400 | 0.004 |
| 4907 | HUNTINGTON NORTH RESERVO | 0.013 | 0.040 | 392.000 | 1.900 | 7.800 | 0.005 |
| 4908 | JOE'S VALLEY RESERVOIR | 0.012 | 0.045 | 400.000 | 2.483 | 11.200 | 0.003 |
| 4909 | MINERSVILLE RESERVOIR | 0.192 | 0.360 | 445.000 | 33.583 | 8.600 | 0.107 |
| 4910 | MOON LAKE | 0.008 | 0.040 | 381.000 | 2.700 | 9.600 | 0.002 |
| 4911 | NAVAJO LAKE | 0.016 | 0.040 | 368.000 | 2.000 | 6.000 | 0.003 |
| 4912 | NEWCASTLE RESERVOIR | 0.051 | 0.040 | 428.667 | 12.467 | 13.600 | 0.009 |
| 4913 | OTTER CREEK RESERVOIR | 0.067 | 0.040 | 453.667 | 11.767 | 10.600 | 0.033 |
| 4914 | PANQUITCH LAKE | 0.071 | 0.040 | 426.500 | 45.950 | 14.200 | 0.010 |
| 4915 | PELICAN LAKE | 0.044 | 0.050 | 438.500 | 6.350 | 8.400 | 0.004 |
| 4916 | PINEVIEW RESERVOIR | 0.028 | 0.300 | 435.083 | 5.692 | 14.600 | 0.006 |
| 4917 | PIUTE RESERVOIR | 0.047 | 0.150 | 482.625 | 25.329 | 11.600 | 0.007 |
| 4918 | PORCUPINE RESERVOIR | 0.025 | 0.110 | 440.000 | 7.860 | 12.400 | 0.011 |
| 4919 | PRUESS RESERVOIR (GARRIS | 0.057 | 0.140 | 491.000 | 4.533 | 8.800 | 0.008 |
| 4920 | SEVIER BRIDGE RESERVOIR | 0.026 | 0.355 | 449.778 | 18.222 | 12.400 | 0.008 |
| 4921 | STARVATION RESERVOIR | 0.016 | 0.040 | 394.583 | 5.675 | 13.200 | 0.004 |
| 4922 | STEINAKER RESERVOIR | 0.011 | 0.040 | 316.750 | 1.844 | 12.600 | 0.005 |
| 4923 | TROPIC RESERVOIR | 0.021 | 0.050 | 425.000 | 7.200 | 8.400 | 0.006 |
| 4924 | UTAH LAKE | 0.132 | 0.320 | 490.583 | 72.012 | 11.400 | 0.012 |
| 4925 | WILLARD BAY RESERVOIR | 0.044 | 0.060 | 457.182 | 7.567 | 11.000 | 0.009 |
| 5605 | FLAMING GORGE RESERVOIR | 0.011 | 0.690 | 285.636 | 2.500 | 10.400 | 0.003 |

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PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

| LAKE CODE | LAKE NAME | MEDIAN TOTAL P | MEDIAN INORG N | 500-MEAN SEC | MEAN CHLORA | 15-MIN DO | MEDIAN DISS ORTHO P | INDEX NO |
|---|---|---|---|---|---|---|---|---|
| 0408 | LAKE POWELL | 96 ( 25) | 4 ( 1) | 81 ( 21) | 73 ( 19) | 15 ( 4) | 42 ( 11) | 311 |
| 4901 | BEAR LAKE | 90 ( 23) | 87 ( 19) | 96 ( 25) | 100 ( 26) | 77 ( 20) | 90 ( 23) | 540 |
| 4902 | LOWER BOWNS RESERVOIR | 46 ( 12) | 87 ( 19) | 85 ( 22) | 65 ( 17) | 73 ( 19) | 50 ( 13) | 406 |
| 4903 | DEER CREEK RESERVOIR | 42 ( 11) | 19 ( 5) | 42 ( 11) | 35 ( 9) | 0 ( 0) | 58 ( 14) | 196 |
| 4904 | ECHO RESERVOIR | 31 ( 8) | 27 ( 7) | 19 ( 5) | 50 ( 13) | 12 ( 3) | 13 ( 3) | 152 |
| 4905 | LYNN RESERVOIR | 8 ( 2) | 23 ( 6) | 58 ( 15) | 8 ( 2) | 62 ( 15) | 4 ( 1) | 163 |
| 4906 | FISH LAKE | 62 ( 16) | 65 ( 16) | 100 ( 26) | 23 ( 6) | 62 ( 15) | 79 ( 20) | 391 |
| 4907 | HUNTINGTON NORTH RESERVO | 77 ( 20) | 65 ( 16) | 69 ( 18) | 92 ( 24) | 96 ( 25) | 69 ( 18) | 468 |
| 4908 | JOE'S VALLEY RESERVOIR | 81 ( 21) | 58 ( 15) | 62 ( 16) | 85 ( 22) | 46 ( 12) | 96 ( 25) | 428 |
| 4909 | MINERSVILLE RESERVOIR | 0 ( 0) | 44 ( 11) | 27 ( 7) | 12 ( 3) | 85 ( 22) | 0 ( 0) | 168 |
| 4910 | MOON LAKE | 100 ( 26) | 87 ( 19) | 73 ( 19) | 77 ( 20) | 69 ( 18) | 100 ( 26) | 506 |
| 4911 | NAVAJO LAKE | 69 ( 18) | 87 ( 19) | 77 ( 20) | 88 ( 23) | 100 ( 26) | 85 ( 22) | 506 |
| 4912 | NEWCASTLE RESERVOIR | 23 ( 6) | 87 ( 19) | 46 ( 12) | 27 ( 7) | 19 ( 5) | 27 ( 7) | 229 |
| 4913 | OTTER CREEK RESERVOIR | 15 ( 4) | 87 ( 19) | 15 ( 4) | 31 ( 8) | 54 ( 14) | 8 ( 2) | 210 |
| 4914 | PANGUITCH LAKE | 12 ( 3) | 65 ( 16) | 50 ( 13) | 4 ( 1) | 8 ( 2) | 23 ( 6) | 162 |
| 4915 | PELICAN LAKE | 37 ( 9) | 54 ( 14) | 35 ( 9) | 54 ( 14) | 90 ( 23) | 73 ( 19) | 343 |
| 4916 | PINEVIEW RESERVOIR | 50 ( 13) | 15 ( 4) | 38 ( 10) | 58 ( 15) | 4 ( 1) | 58 ( 14) | 223 |
| 4917 | PIUTE RESERVOIR | 27 ( 7) | 31 ( 8) | 8 ( 2) | 15 ( 4) | 38 ( 10) | 46 ( 12) | 165 |
| 4918 | PORCUPINE RESERVOIR | 58 ( 15) | 38 ( 10) | 31 ( 8) | 38 ( 10) | 33 ( 8) | 19 ( 5) | 217 |
| 4919 | PRUESS RESERVOIR (GARRIS | 19 ( 5) | 35 ( 9) | 0 ( 0) | 69 ( 18) | 81 ( 21) | 37 ( 9) | 241 |
| 4920 | SEVIER BRIDGE RESERVOIR | 54 ( 14) | 8 ( 2) | 23 ( 6) | 19 ( 5) | 33 ( 8) | 37 ( 9) | 174 |
| 4921 | STARVATION RESERVOIR | 73 ( 19) | 87 ( 19) | 65 ( 17) | 62 ( 16) | 23 ( 6) | 79 ( 20) | 389 |
| 4922 | STEINAKER RESERVOIR | 85 ( 22) | 87 ( 19) | 88 ( 23) | 96 ( 25) | 27 ( 7) | 65 ( 17) | 448 |
| 4923 | TROPIC RESERVOIR | 65 ( 17) | 50 ( 13) | 54 ( 14) | 46 ( 12) | 90 ( 23) | 58 ( 14) | 363 |
| 4924 | UTAH LAKE | 4 ( 1) | 12 ( 3) | 4 ( 1) | 0 ( 0) | 42 ( 11) | 13 ( 3) | 75 |
| 4925 | WILLARD BAY RESERVOIR | 37 ( 9) | 44 ( 11) | 12 ( 3) | 42 ( 11) | 50 ( 13) | 31 ( 8) | 216 |
| 5505 | FLAMING GORGE RESERVOIR | 90 ( 23) | 0 ( 0) | 92 ( 24) | 81 ( 21) | 62 ( 15) | 90 ( 23) | 415 |

LAKES RANKED BY INDEX NOS.

| RANK | LAKE CODE | LAKE NAME | INDEX NO |
|---|---|---|---|
| 1 | 4901 | BEAR LAKE | 540 |
| 2 | 4911 | NAVAJO LAKE | 506 |
| 3 | 4910 | MOON LAKE | 506 |
| 4 | 4907 | HUNTINGTON NORTH RESERVO | 468 |
| 5 | 4922 | STEINAKER RESERVOIR | 448 |
| 6 | 4908 | JOE'S VALLEY RESERVOIR | 428 |
| 7 | 9605 | FLAMING GORGE RESERVOIR | 415 |
| 8 | 4902 | LOWER BOWN'S RESERVOIR | 406 |
| 9 | 4906 | FISH LAKE | 391 |
| 10 | 4921 | STARVATION RESERVOIR | 389 |
| 11 | 4920 | TROPIC RESERVOIR | 363 |
| 12 | 4915 | PELICAN LAKE | 343 |
| 13 | 0408 | LAKE POWELL | 311 |
| 14 | 4919 | PRUESS RESERVOIR (GARRIS | 241 |
| 15 | 4912 | NEWCASTLE RESERVOIR | 229 |
| 16 | 4916 | PINEVIEW RESERVOIR | 223 |
| 17 | 4918 | PORCUPINE RESERVOIR | 217 |
| 18 | 4926 | WILLARD BAY RESERVOIR | 216 |
| 19 | 4913 | OTTER CREEK RESERVOIR | 210 |
| 20 | 4903 | DEER CREEK RESERVOIR | 196 |
| 21 | 4920 | SEVIER BRIDGE RESERVOIR | 174 |
| 22 | 4909 | MINERSVILLE RESERVOIR | 168 |
| 23 | 4917 | PIUTE RESERVOIR | 165 |
| 24 | 4905 | LYNN RESERVOIR | 163 |
| 25 | 4914 | PAROUITCH LAKE | 162 |
| 26 | 4904 | ECHO RESERVOIR | 152 |
| 27 | 4924 | UTAH LAKE | 75 |

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# APPENDIX B

## CONVERSION FACTORS

## CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x $8.107 \times 10^{-4}$ = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

# APPENDIX C

## TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR UTAH 10/18/76

LAKE CODE 4903 DEER CRK RES

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 1450.4

| TRIBUTARY | SUB-DRAINAGE AREA(SQ KM) | NORMALIZED FLOWS(CMS) JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | MEAN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4903A1 | 1450.4 | 6.80 | 6.80 | 7.36 | 8.78 | 16.42 | 24.35 | 15.01 | 12.18 | 10.19 | 5.95 | 5.38 | 7.08 | 10.54 |
| 4903A2 | 976.4 | 3.40 | 3.40 | 4.25 | 10.48 | 28.32 | 25.20 | 6.80 | 3.40 | 2.83 | 3.11 | 3.68 | 3.68 | 8.23 |
| 4903B1 | 4.7 | 0.003 | 0.003 | 0.003 | 0.011 | 0.037 | 0.037 | 0.017 | 0.008 | 0.006 | 0.006 | 0.003 | 0.003 | 0.011 |
| 4903C1 | 82.9 | 1.19 | 1.16 | 1.27 | 1.30 | 1.59 | 1.67 | 1.27 | 1.10 | 1.10 | 1.30 | 1.36 | 1.25 | 1.30 |
| 4903D1 | 126.9 | 0.113 | 0.142 | 0.142 | 0.340 | 0.227 | 0.028 | 0.003 | 0.006 | 0.011 | 0.028 | 0.085 | 0.085 | 0.100 |
| 4903E1 | 186.5 | 0.263 | 0.396 | 0.481 | 1.048 | 1.104 | 0.311 | 0.102 | 0.088 | 0.091 | 0.139 | 0.232 | 0.246 | 0.375 |
| 4903F1 | 150.2 | 0.14 | 0.14 | 0.17 | 0.54 | 1.61 | 1.73 | 0.74 | 0.31 | 0.23 | 0.20 | 0.17 | 0.14 | 0.51 |
| 4903Z2 | 72.5 | 0.42 | 0.42 | 0.51 | 0.82 | 1.70 | 1.70 | 0.54 | 0.31 | 0.28 | 0.34 | 0.45 | 0.45 | 0.66 |

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 1450.4
SUM OF SUB-DRAINAGE AREAS = 1600.1
TOTAL FLOW IN = 134.04
TOTAL FLOW OUT = 126.29

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

| TRIBUTARY | MONTH | YEAR | MEAN FLOW | DAY | FLOW | DAY | FLOW | DAY | FLOW |
|---|---|---|---|---|---|---|---|---|---|
| 4903A1 | 11 | 74 | 4.757 | 10 | 3.030 | | | | |
| | 12 | 74 | 9.203 | 14 | 10.845 | | | | |
| | 1 | 75 | 8.184 | 11 | 8.269 | | | | |
| | 2 | 75 | 5.947 | 8 | 8.240 | | | | |
| | 3 | 75 | 3.710 | 8 | 2.520 | | | | |
| | 4 | 75 | 10.024 | 5 | 10.137 | | | | |
| | 5 | 75 | 12.856 | 3 | 9.713 | 17 | 15.886 | | |
| | 6 | 75 | 40.068 | 7 | 46.723 | 21 | 44.457 | | |
| | 7 | 75 | 22.342 | 12 | 28.883 | | | | |
| | 8 | 75 | 15.574 | 16 | 16.509 | | | | |
| | 9 | 75 | 13.819 | 13 | 14.696 | | | | |
| | 10 | 75 | 6.768 | 5 | 11.327 | | | | |
| 4903A2 | 11 | 74 | 5.097 | 10 | 4.814 | | | | |
| | 12 | 74 | 3.681 | 14 | 4.814 | | | | |
| | 1 | 75 | 3.964 | 11 | 4.248 | | | | |
| | 2 | 75 | 3.964 | 8 | 4.248 | | | | |
| | 3 | 75 | 4.531 | 8 | 4.814 | | | | |
| | 4 | 75 | 5.380 | 5 | 4.814 | | | | |
| | 5 | 75 | 21.521 | 3 | 7.929 | 17 | 40.493 | | |
| | 6 | 75 | 40.210 | 7 | 62.297 | 21 | 33.980 | | |
| | 7 | 75 | 14.725 | 12 | 25.485 | | | | |
| | 8 | 75 | 5.947 | 9 | 9.061 | | | | |
| | 9 | 75 | 3.964 | 13 | 6.230 | | | | |
| | 10 | 75 | 5.947 | 4 | 4.814 | | | | |

TRIBUTARY FLOW INFORMATION FOR UTAH 10/18/76

LAKE CODE 4903 DEER CRK RES

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

| TRIBUTARY | MONTH | YEAR | MEAN FLOW | DAY | FLOW | DAY | FLOW | DAY | FLOW |
|---|---|---|---|---|---|---|---|---|---|
| 4903B1 | 11 | 74 | 0.003 | | | | | | |
| | 12 | 74 | 0.003 | | | | | | |
| | 1 | 75 | 0.003 | | | | | | |
| | 2 | 75 | 0.003 | | | | | | |
| | 3 | 75 | 0.003 | | | | | | |
| | 4 | 75 | 0.003 | | | | | | |
| | 5 | 75 | 0.028 | | | | | | |
| | 6 | 75 | 0.076 | | | | | | |
| | 7 | 75 | 0.051 | | | | | | |
| | 8 | 75 | 0.017 | | | | | | |
| | 9 | 75 | 0.008 | | | | | | |
| | 10 | 75 | 0.006 | | | | | | |
| 4903C1 | 11 | 74 | 1.982 | 10 | 1.671 | | | | |
| | 12 | 74 | 1.133 | 14 | 1.444 | | | | |
| | 1 | 75 | 1.133 | 11 | 1.398 | | | | |
| | 2 | 75 | 1.416 | 8 | 1.472 | | | | |
| | 3 | 75 | 1.699 | 8 | 1.812 | | | | |
| | 4 | 75 | 2.265 | 5 | 2.010 | | | | |
| | 5 | 75 | 1.699 | 3 | 2.152 | 17 | 2.067 | | |
| | 6 | 75 | 2.549 | 7 | 2.832 | 21 | 2.832 | | |
| | 7 | 75 | 1.133 | 12 | 2.237 | | | | |
| | 8 | 75 | 0.850 | 9 | 1.048 | | | | |
| | 9 | 75 | 0.850 | 13 | 1.161 | | | | |
| | 10 | 75 | 1.416 | 5 | 1.104 | | | | |
| 4903D1 | 11 | 74 | 0.113 | 10 | 0.963 | | | | |
| | 12 | 74 | 0.085 | 14 | 0.085 | | | | |
| | 2 | 75 | 0.113 | | | | | | |
| | 3 | 75 | 0.113 | 8 | 0.113 | | | | |
| | 4 | 75 | 0.198 | 5 | 0.198 | | | | |
| | 5 | 75 | 0.368 | 3 | 0.198 | 17 | 0.368 | | |
| | 6 | 75 | 0.368 | 7 | 0.991 | 21 | 0.283 | | |
| | 7 | 75 | 0.003 | 12 | 0.003 | | | | |
| | 8 | 75 | 0.011 | 9 | 0.014 | | | | |
| | 9 | 75 | 0.017 | 13 | 0.023 | | | | |
| | 10 | 75 | 0.113 | 5 | 0.028 | | | | |
| 4903E1 | 11 | 74 | 0.198 | 10 | 0.198 | | | | |
| | 12 | 74 | 0.142 | 14 | 0.170 | | | | |
| | 1 | 75 | 0.227 | 11 | 0.227 | | | | |
| | 2 | 75 | 0.227 | 8 | 0.227 | | | | |
| | 3 | 75 | 0.283 | 8 | 0.283 | | | | |
| | 4 | 75 | 0.283 | 5 | 0.227 | | | | |
| | 5 | 75 | 0.538 | 3 | 0.311 | 17 | 0.510 | | |
| | 6 | 75 | 1.614 | 7 | 1.699 | 21 | 1.133 | | |
| | 7 | 75 | 0.481 | 12 | 0.566 | | | | |
| | 8 | 75 | 0.340 | 9 | 0.368 | | | | |
| | 9 | 75 | 0.227 | 13 | 0.255 | | | | |
| | 10 | 75 | 0.170 | 5 | 0.170 | | | | |

TRIBUTARY FLOW INFORMATION FOR UTAH 10/18/76

LAKE CODE 4903 DEER CRK RES

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

| TRIBUTARY | MONTH | YEAR | MEAN FLOW | DAY | FLOW | DAY | FLOW | DAY | FLOW |
|---|---|---|---|---|---|---|---|---|---|
| 4903F1 | 11 | 74 | 0.170 | | | | | | |
| | 12 | 74 | 0.142 | | | | | | |
| | 1 | 75 | 0.142 | | | | | | |
| | 2 | 75 | 0.142 | | | | | | |
| | 3 | 75 | 0.142 | | | | | | |
| | 4 | 75 | 0.170 | | | | | | |
| | 5 | 75 | 1.274 | | | | | | |
| | 6 | 75 | 3.398 | | | | | | |
| | 7 | 75 | 2.265 | | | | | | |
| | 8 | 75 | 0.736 | | | | | | |
| | 9 | 75 | 0.425 | | | | | | |
| | 10 | 75 | 0.255 | | | | | | |
| 4903ZZ | 11 | 74 | 0.566 | | | | | | |
| | 12 | 74 | 0.368 | | | | | | |
| | 1 | 75 | 0.425 | | | | | | |
| | 2 | 75 | 0.453 | | | | | | |
| | 3 | 75 | 0.566 | | | | | | |
| | 4 | 75 | 0.623 | | | | | | |
| | 5 | 75 | 1.642 | | | | | | |
| | 6 | 75 | 2.718 | | | | | | |
| | 7 | 75 | 1.019 | | | | | | |
| | 8 | 75 | 0.425 | | | | | | |
| | 9 | 75 | 0.340 | | | | | | |
| | 10 | 75 | 0.510 | | | | | | |

# APPENDIX D

## PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 76/08/12

490301
40 24 35.0 111 31 20.0 3
DEER CREEK RESERVOIR
49051 UTAH

150791

11EPALES 2111202
0110 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00010 WATER TEMP CENT | 00300 DO MG/L | 00077 TRANSP SECCHI INCHES | 00094 CNDUCTVY FIELD MICROMHO | 00400 PH SU | 00410 T ALK CACO3 MG/L | 00610 NH3-N TOTAL MG/L | 00625 TOT KJEL N MG/L | 00630 NO2&NO3 N-TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 75/08/12 | 16 40 | 0000 | 8.5 | 10.4 | 72 | 315 | 8.65 | 145 | 0.040 | 0.400 | 0.190 | 0.006 |
| | 16 40 | 0005 | 8.4 | 10.4 | | 315 | 8.70 | 145 | 0.040 | 0.500 | 0.190 | 0.006 |
| | 16 40 | 0025 | 7.6 | 9.8 | | 305 | 8.60 | 147 | 0.080 | 0.600 | 0.210 | 0.011 |
| | 16 40 | 0050 | 6.6 | 9.2 | | 301 | 8.40 | 149 | 0.120 | 0.500 | 0.250 | 0.013 |
| | 16 40 | 0075 | 5.4 | 8.8 | | 297 | 8.35 | 148 | 0.130 | 0.400 | 0.270 | 0.014 |
| | 16 40 | 0106 | 5.0 | 8.6 | | 294 | 8.30 | 148 | 0.180 | 0.600 | 0.270 | 0.021 |
| 75/08/11 | 15 05 | 0000 | 23.1 | 7.2 | 84 | 300 | 8.70 | 115 | 0.020K | 0.400 | 0.070 | 0.008 |
| | 15 05 | 0005 | 23.2 | 7.0 | | 294 | 8.60 | 116 | 0.020 | 0.400 | 0.070 | 0.005 |
| | 15 05 | 0020 | 22.5 | 6.4 | | 290 | 8.20 | 115 | 0.040 | 0.400 | 0.090 | 0.007 |
| | 15 05 | 0050 | 15.4 | 3.8 | | 218 | 7.90 | 113 | 0.020K | 0.300 | 0.370 | 0.044 |
| | 15 05 | 0085 | 13.1 | 3.2 | | 228 | 7.80 | 112 | 0.020 | 0.200K | 0.380 | 0.050 |
| | 15 05 | 0115 | 12.7 | 2.6 | | 238 | 7.80 | 114 | 0.020 | 0.200K | 0.390 | 0.058 |
| 75/09/19 | 14 15 | 0000 | 18.4 | 8.0 | 108 | 301 | 8.45 | 143 | 0.020K | 0.400 | 0.130 | 0.004 |
| | 14 15 | 0005 | 18.4 | 8.0 | | 300 | 8.40 | 145 | 0.020K | 0.400 | 0.130 | 0.003 |
| | 14 15 | 0015 | 17.9 | 7.2 | | 300 | 8.30 | 142 | 0.020K | 0.300 | 0.150 | 0.002 |
| | 14 15 | 0030 | 17.8 | 7.0 | | 300 | 8.10 | 141 | 0.020K | 0.200 | 0.180 | 0.002 |
| | 14 15 | 0050 | 17.8 | 6.2 | | 300 | 8.00 | 141 | 0.020K | 0.200 | 0.200 | 0.004 |
| | 14 15 | 0080 | 15.3 | 1.0 | | 248 | 7.60 | 126 | 0.040 | 0.300 | 0.440 | 0.024 |
| | 14 15 | 0115 | 13.3 | 0.2 | | 223 | 7.50 | 120 | 0.270 | 0.800 | 0.240 | 0.069 |

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/08/12

490301
40 24 35.0 111 31 20.0 3
DEER CREEK RESERVOIR
49051 UTAH
150791

11EPALES 2111202
0110 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00665 PHOS-TOT MG/L P | 32217 CHLRPHYL A UG/L | 00031 INCDT LT REMNING PERCENT |
|---|---|---|---|---|---|
| 75/05/12 | 16 40 | 0000 | 0.036 | 8.5 | |
| | 16 40 | 0005 | 0.044 | | |
| | 16 40 | 0025 | 0.041 | | |
| | 16 40 | 0050 | 0.032 | | |
| | 16 40 | 0075 | 0.030 | | |
| | 16 40 | 0106 | 0.054 | | |
| 75/08/11 | 15 05 | 0000 | 0.028 | 1.5 | |
| | 15 05 | 0005 | 0.020 | | |
| | 15 05 | 0020 | 0.020 | | |
| | 15 05 | 0050 | 0.046 | | |
| | 15 05 | 0085 | 0.066 | | |
| | 15 05 | 0115 | 0.089 | | |
| 75/09/19 | 14 15 | 0000 | 0.019 | 11.6 | |
| | 14 15 | 0005 | 0.017 | | |
| | 14 15 | 0015 | 0.016 | | |
| | 14 15 | 0030 | 0.016 | | |
| | 14 15 | 0050 | 0.014 | | |
| | 14 15 | 0080 | 0.087 | | |
| | 14 15 | 0115 | 0.285 | | |

23

STORET RETRIEVAL DATE 75/08/12

490302
40 26 04.0 111 28 48.0 3
DEER CREEK RESERVOIR
49051 UTAH

11EPALES 2111202
0071 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00010 WATER TEMP CENT | 00300 DO MG/L | 00077 TRANSP SECCHI INCHES | 00094 CNDUCTVY FIELD MICROMHO | 00400 PH SU | 00410 T ALK CACO3 MG/L | 00610 NH3-N TOTAL MG/L | 00625 TOT KJEL N MG/L | 00630 NO2&NO3 N-TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 75/05/12 | 16 | 10 0000 | 9.0 | 10.4 | 69 | 316 | 8.65 | 143 | 0.030 | 0.500 | 0.180 | 0.011 |
| | 16 | 10 0005 | 8.8 | 10.4 | | 315 | 8.65 | 143 | 0.030 | 0.600 | 0.180 | 0.010 |
| | 16 | 10 0025 | 8.1 | 9.6 | | 308 | 8.45 | 147 | 0.100 | 0.500 | 0.220 | 0.013 |
| | 16 | 10 0050 | 6.1 | 9.0 | | 298 | 8.35 | 148 | 0.120 | 0.400 | 0.240 | 0.011 |
| | 16 | 10 0071 | 5.4 | 11.0 | | 295 | 8.65 | 143 | 0.030 | 0.400 | 0.190 | 0.006 |
| 75/08/11 | 14 | 40 0000 | 23.3 | 7.8 | 84 | 314 | 8.70 | 117 | 0.020 | 0.400 | 0.050 | 0.004 |
| | 14 | 40 0005 | 23.4 | 7.2 | | 313 | 8.80 | 116 | 0.020 | 0.400 | 0.050 | 0.004 |
| | 14 | 40 0020 | 21.3 | 5.8 | | 308 | 8.13 | 121 | 0.030 | 0.400 | 0.140 | 0.002 |
| | 14 | 40 0045 | 16.1 | 4.4 | | 244 | 7.95 | 106 | 0.020K | 0.300 | 0.350 | 0.013 |
| | 14 | 40 0080 | 12.9 | 4.8 | | 223 | 8.10 | 106 | 0.020K | 0.300 | 0.360 | 0.029 |
| 75/09/19 | 13 | 35 0000 | 18.7 | 9.0 | 72 | 304 | 8.50 | 146 | 0.020K | 0.400 | 0.070 | 0.002 |
| | 13 | 35 0005 | 18.7 | 9.0 | | 302 | 8.50 | 142 | 0.020K | 0.500 | 0.070 | 0.004 |
| | 13 | 35 0015 | 18.3 | 8.2 | | 303 | 8.50 | 146 | 0.020K | 0.500 | 0.070 | 0.003 |
| | 13 | 35 0030 | 18.3 | 8.6 | | 308 | 8.00 | 147 | 0.030 | 0.500 | 0.150 | 0.003 |
| | 13 | 35 0050 | 17.5 | 3.6 | | 321 | 7.70 | 151 | 0.040 | 0.400 | 0.350 | 0.004 |
| | 13 | 35 0071 | 16.6 | 3.4 | | 338 | 7.80 | 158 | 0.100 | 0.400 | 0.280 | 0.019 |

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00665 PHOS-TOT MG/L P | 32217 CHLRPHYL A UG/L | 00031 INCOT LT REMNING PERCENT |
|---|---|---|---|---|---|
| 75/05/12 | 16 | 10 0000 | 0.046 | 9.3 | |
| | 16 | 10 0005 | 0.035 | | |
| | 16 | 10 0025 | 0.027 | | |
| | 16 | 10 0050 | 0.028 | | |
| | 16 | 10 0071 | 0.045 | | |
| 75/08/11 | 14 | 40 0000 | 0.024 | 1.3 | |
| | 14 | 40 0005 | 0.025 | | |
| | 14 | 40 0020 | 0.020 | | |
| | 14 | 40 0045 | 0.045 | | |
| | 14 | 40 0080 | 0.052 | | |
| 75/09/19 | 13 | 35 0000 | 0.039 | 18.7 | |
| | 13 | 35 0005 | 0.033 | | |
| | 13 | 35 0015 | 0.033 | | |
| | 13 | 35 0030 | 0.037 | | |
| | 13 | 35 0050 | 0.030 | | |
| | 13 | 35 0071 | 0.099 | | |

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/08/12

490303
40 28 06.0 111 29 58.0 3
DEER CREEK RESERVOIR
49051 UTAH

11EPALES 2111202
0016 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00010 WATER TEMP CENT | 00300 DO MG/L | 00077 TRANSP SECCHI INCHES | 00094 CNDUCTVY FIELD MICROMHO | 00400 PH SU | 00410 T ALK CACO3 MG/L | 00610 NH3-N TOTAL MG/L | 00625 TOT KJEL N MG/L | 00630 NO2&NO3 N-TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 75/05/12 | 15 50 | 0000 | 9.5 | 9.6 | 42 | 310 | 8.55 | 138 | 0.030 | 0.400 | 0.190 | 0.015 |
| | 15 50 | 0005 | 9.3 | 9.8 | | 306 | 8.50 | 136 | 0.030 | 0.400 | 0.200 | 0.014 |
| | 15 50 | 0012 | 8.5 | 9.0 | | 307 | 8.50 | 136 | 0.030 | 0.300 | 0.200 | 0.013 |
| 75/08/11 | 14 20 | 0000 | 23.2 | 8.8 | 60 | 333 | 9.00 | 114 | 0.020K | 0.200 | 0.020K | 0.003 |
| | 14 20 | 0005 | 23.8 | 9.0 | | 331 | 9.40 | 114 | 0.020K | 0.200K | 0.020K | 0.004 |
| | 14 20 | 0014 | 22.3 | 8.1 | | 330 | 9.40 | 126 | 0.020K | 0.500 | 0.020K | 0.006 |
| 75/09/19 | 13 15 | 0000 | 18.8 | 10.4 | 36 | 311 | 8.80 | 146 | 0.020 | 0.400 | 0.030 | 0.004 |
| | 13 15 | 0005 | 18.3 | 9.0 | | 305 | 8.70 | 146 | 0.020 | 0.400 | 0.030 | 0.004 |
| | 13 15 | 0018 | 18.2 | 9.0 | | 303 | 8.70 | 145 | 0.020K | 0.400 | 0.030 | 0.003 |

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00665 PHOS-TOT MG/L P | 32217 CHLRPHYL A UG/L | 00031 INCDT LT REMNING PERCENT |
|---|---|---|---|---|---|
| 75/05/12 | 15 50 | 0000 | 0.052 | 4.3 | |
| | 15 50 | 0005 | 0.045 | | |
| | 15 50 | 0012 | 0.048 | | |
| 75/08/11 | 14 20 | 0000 | 0.042 | 1.3 | |
| | 14 20 | 0005 | 0.045 | | |
| | 14 20 | 0014 | 0.038 | | |
| 75/09/19 | 13 15 | 0000 | 0.050 | 25.2 | |
| | 13 15 | 0005 | 0.050 | | |
| | 13 15 | 0018 | 0.051 | | |

K VALUE KNOWN TO BE
LESS THAN INDICATED

69

# APPENDIX E

## TRIBUTARY AND WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 76/08/12

490341
40 24 16.0 111 31 42.0 4
PROVO RIVER
49 7.5 ASPEN GROVE
U/DEER CREEK RESERVOIR 150791
GAGE STATN .2 MI S OF DEER CREEK DAM
11EPALES 2111204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P |
|---|---|---|---|---|---|---|---|
| 74/11/10 | 13 00 | | 0.216 | 0.600 | 0.230 | 0.025 | 0.040 |
| 74/12/14 | 10 00 | | 0.272 | 0.600 | 0.220 | 0.020 | 0.040 |
| 75/01/11 | 09 40 | | 0.432 | 0.800 | 0.180 | 0.030 | 0.040 |
| 75/02/08 | 10 00 | | 0.504 | 0.200 | 0.072 | 0.040 | 0.050 |
| 75/03/08 | | | 0.480 | 0.600 | 0.056 | 0.032 | 0.050 |
| 75/04/05 | 09 30 | | 0.480 | 0.350 | 0.090 | 0.045 | 0.070 |
| 75/05/03 | 09 15 | | 0.220 | 0.350 | 0.040 | 0.005 | 0.040 |
| 75/05/17 | 10 00 | | 0.230 | 0.150 | 0.125 | 0.015 | 0.040 |
| 75/06/07 | 09 45 | | 0.220 | 0.450 | 0.050 | 0.020 | 0.060 |
| 75/06/21 | 10 00 | | 0.190 | 0.450 | 0.030 | 0.010 | 0.040 |
| 75/07/12 | 10 10 | | 0.155 | 0.250 | 0.035 | 0.010 | 0.040 |
| 75/08/16 | 08 50 | | 0.375 | 0.300 | 0.030 | 0.060 | 0.070 |
| 75/09/13 | 12 30 | | 0.375 | 0.500 | 0.035 | 0.045 | |
| 75/10/05 | 09 30 | | 0.170 | 0.300 | 0.040 | 0.005 | 0.030 |

STORET RETRIEVAL DATE 76/08/12

4903A2
40 29 03.0 111 27 52.0 4
PROVO RIVER
49 7.5 CHARLESTON
T/DEER CREEK RESERVOIR
DRT RD BRDG 1.2 MI N OF CHARLESTON
11EPALES 2111204
000C FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P |
|---|---|---|---|---|---|---|---|
| 74/11/10 | 14 | 50 | 0.368 | 0.200 | 0.020 | 0.035 | 0.040 |
| 74/12/14 | 09 | 55 | 0.480 | 0.750 | 0.035 | 0.025 | 0.035 |
| 75/01/11 | 11 | 50 | 0.416 | | 0.027 | 0.027 | 0.040 |
| 75/03/08 | | | 0.284 | 1.100 | 0.040 | 0.028 | 0.060 |
| 75/04/05 | 09 | 15 | 0.195 | 0.250 | 0.045 | 0.030 | 0.070 |
| 75/05/03 | 12 | 20 | 0.130 | 0.300 | 0.030 | 0.010 | 0.050 |
| 75/05/17 | 09 | 45 | 0.370 | 0.150 | 0.030 | 0.030 | 0.020 |
| 75/06/07 | 08 | 45 | 0.185 | 1.000 | 0.030 | 0.015 | |
| 75/06/21 | 09 | 35 | 0.240 | 0.300 | 0.015 | 0.020 | 0.050 |
| 75/07/12 | 10 | 00 | 0.260 | 0.300 | 0.015 | 0.025 | 0.090 |
| 75/08/09 | 14 | 45 | 0.970 | 0.700 | 0.032 | 0.065 | 0.080 |
| 75/09/13 | 13 | 00 | 0.720 | 0.300 | 0.030 | 0.070 | 0.120 |
| 75/10/04 | 09 | 40 | 0.870 | 0.200 | 0.040 | 0.075 | 0.120 |

STORET RETRIEVAL DATE 76/08/12

490381
40 27 30.0 111 30 40.0 4
DECKER CREEK
49 7.5 ASPEN GROVE
T/DEER CREEK RESERVOIR 150791
BNK 100 FT E OF DRT RD 6 M W OF CHRLSTON
11EPALES 2111204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P |
|---|---|---|---|---|---|---|---|
| 74/11/10 | 13 40 | | 0.088 | 0.100 | 0.040 | 0.005 | 0.020 |
| 75/05/03 | 10 30 | | 0.190 | 0.250 | 0.026 | 0.030 | 0.080 |
| 75/05/17 | 14 45 | | 0.060 | 0.150 | 0.025 | 0.007 | 0.010 |
| 75/06/07 | 10 50 | | 0.120 | 0.250 | 0.015 | 0.030 | 0.090 |
| 75/06/21 | 11 10 | | 0.090 | 0.450 | 0.017 | 0.027 | 0.080 |
| 75/07/12 | 11 30 | | 0.130 | 0.400 | 0.010 | 0.035 | 0.060 |
| 75/08/09 | 10 00 | | 0.115 | 0.100 | 0.055 | 0.020 | 0.020 |
| 75/09/13 | 14 00 | | 0.065 | 0.200 | 0.010 | 0.030 | 0.110 |
| 75/10/05 | 13 15 | | 0.060 | 0.100K | 0.005K | 0.045 | 0.060 |

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/08/12

4903C1
40 29 10.0 111 28 00.0 4
SNAKE CREEK
49 7.5 CHARLESTON
T/DEER CREEK RESERVOIR
RR BRDG 1.4 MI N OF CHARLESTON
11EPALES 2111204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P |
|---|---|---|---|---|---|---|---|
| 74/11/10 | 14 20 | | 0.720 | 0.300 | 0.170 | 0.035 | 0.035 |
| 74/12/14 | 10 10 | | 0.576 | 0.700 | 0.100 | 0.040 | 0.050 |
| 75/01/11 | 11 30 | | 0.528 | 0.500 | 0.100 | 0.055 | 0.090 |
| 75/02/08 | 09 55 | | 0.490 | 0.600 | 0.128 | 0.072 | 0.100 |
| 75/03/08 | | | 0.485 | 1.200 | 0.136 | 0.068 | 0.070 |
| 75/04/05 | 09 10 | | 0.540 | 0.500 | 0.135 | 0.060 | 0.130 |
| 75/05/03 | 11 20 | | 0.620 | 0.600 | 0.185 | 0.110 | 0.160 |
| 75/05/17 | 10 00 | | 1.100 | 0.100 | 0.095 | 0.100 | 0.116 |
| 75/06/07 | 09 03 | | 0.760 | 0.875 | 0.130 | 0.050 | 0.120 |
| 75/06/21 | 09 50 | | 0.780 | 0.350 | 0.085 | 0.040 | 0.050 |
| 75/07/12 | 10 30 | | 1.200 | 0.665 | 0.090 | 0.045 | 0.091 |
| 75/08/09 | 09 50 | | 1.050 | 0.350 | 0.065 | 0.040 | 0.050 |
| 75/09/13 | 13 15 | | 0.770 | 0.600 | 0.230 | 0.045 | 0.120 |
| 75/10/05 | 16 25 | | 0.790 | 0.200 | 0.040 | 0.040 | 0.080 |

STORET RETRIEVAL DATE 75/08/12

490301
40 27 40.0 111 28 15.0 4
DANIELS CREEK
49 7.5 CHARLESTON
T/DEER CREEK RESERVOIR
HWY 113 BRDG .1 MI S OF CHARLESTON
11EPALES 2111204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P |
|---|---|---|---|---|---|---|---|
| 74/11/10 | 12 00 | | 0.810 | 0.400 | 0.015 | 0.315 | 0.340 |
| 74/12/14 | 10 30 | | 0.672 | 0.800 | 0.185 | 0.185 | 0.280 |
| 75/04/05 | 09 00 | | 0.590 | 0.700 | 0.035 | 0.070 | 0.170 |
| 75/05/03 | 11 00 | | 0.280 | 0.800 | 0.200 | 0.210 | 0.320 |
| 75/05/17 | 09 30 | | 0.430 | 0.150 | 0.065 | 0.050 | |
| 75/06/07 | 08 30 | | 0.230 | 1.350 | 0.030 | 0.030 | 0.230 |
| 75/06/21 | 09 20 | | 0.820 | 0.900 | 0.025 | 0.120 | 0.210 |
| 75/07/12 | 09 45 | | 1.100 | 0.350 | 0.060 | 0.185 | 0.213 |
| 75/08/09 | 09 40 | | 1.050 | 0.600 | 0.025 | 0.175 | 0.200 |
| 75/09/13 | 12 50 | | 1.050 | 0.400 | 0.020 | 0.180 | 0.230 |
| 75/10/05 | | | 0.085 | 0.100 | 0.005 | 0.050 | 0.060 |

STORET RETRIEVAL DATE 76/08/12

4903E1
40 24 17.0 111 27 52.0 4
MAIN CHANNEL
49 7.5 CHARLESTON
T/DEER CREEK RESERVOIR
PRVT RD BRDG 2.2 MI N= OF WALLSBURG
11EPALES 2111204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P |
|---|---|---|---|---|---|---|---|
| 74/11/10 | 11 | 10 | 0.384 | 0.500 | 0.015 | 0.030 | 0.050 |
| 74/12/14 | 11 | 25 | 0.576 | 1.000 | 0.045 | 0.035 | 0.070 |
| 75/01/11 | 12 | 20 | 0.576 | 0.300 | 0.030 | 0.035 | 0.070 |
| 75/02/08 | 09 | 15 | 0.520 | 0.700 | 0.040 | 0.040 | 0.080 |
| 75/03/08 | | | 0.624 | 1.250 | 0.080 | 0.048 | 0.140 |
| 75/04/05 | 08 | 50 | 0.610 | 0.400 | 0.025 | 0.030 | 0.100 |
| 75/05/03 | 13 | 00 | 0.315 | 0.700 | 0.060 | 0.035 | 0.160 |
| 75/05/17 | 09 | 10 | 0.280 | 0.500 | 0.050 | 0.063 | 0.252 |
| 75/06/07 | 08 | 20 | 0.145 | 0.650 | 0.020 | 0.040 | 0.140 |
| 75/06/21 | 09 | 00 | 0.280 | 0.600 | 0.020 | 0.035 | 0.070 |
| 75/07/12 | 09 | 30 | 0.210 | 0.700 | 0.050 | 0.070 | 0.190 |
| 75/08/09 | 09 | 30 | 0.095 | 0.600 | 0.030 | 0.045 | 0.060 |
| 75/09/13 | 12 | 30 | 0.220 | 0.900 | 0.050 | 0.060 | 0.170 |

STORET RETRIEVAL DATE 76/08/12

4903F1
40 30 26.0 111 26 26.0 4
SPRING CREEK
49 7.5 HEBER CITY
T/DEER CREEK RESERVOIR 150791
HWY 113 BRDG BELOW HEBER CITY STP
11EPALES 2111204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P |
|---|---|---|---|---|---|---|---|
| 74/11/10 | 12 | 15 | 0.650 | 0.500 | 0.065 | 0.330 | 0.370 |
| 74/12/10 | 18 | 35 | 0.624 | 0.600 | 0.125 | 0.210 | 0.300 |
| 75/01/11 | 10 | 00 | 0.540 | 1.100 | 0.280 | 0.250 | 0.400 |
| 75/02/08 | 10 | 15 | 0.384 | 1.000 | 0.256 | 0.208 | 0.320 |
| 75/03/08 | | | 0.232 | 1.850 | 0.168 | 0.152 | 0.280 |
| 75/04/05 | 10 | 00 | 0.340 | 0.950 | 0.240 | 0.200 | 0.335 |
| 75/05/03 | 10 | 00 | 0.210 | 0.850 | 0.195 | 0.210 | 0.320 |
| 75/05/17 | 10 | 14 | 0.230 | 2.000 | 0.140 | 0.115 | 0.210 |
| 75/06/07 | 09 | 10 | 0.480 | 0.850 | 0.050 | 0.105 | 0.220 |
| 75/06/21 | 10 | 05 | 0.660 | 1.050 | 0.060 | 0.115 | 0.190 |
| 75/08/09 | 10 | 20 | 0.990 | 0.900 | 0.145 | 0.230 | 0.280 |
| 75/09/13 | 13 | 30 | 0.750 | 0.900 | 0.175 | 0.280 | 0.460 |
| 75/10/05 | 10 | 30 | 0.550 | 0.200 | 0.020 | 0.190 | 0.220 |

STORET RETRIEVAL DATE 76/08/12

4903AA NU4903AA P000000
40 30 00.0 111 28 00.0 4
CLEARVIEW TROUT FARM
49 7.5 HEBER
T/DEER CREEK RES. 150791
PROVO RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P | 50051 FLOW RATE INST MGD | 50053 CONDUIT FLOW-MGD MONTHLY |
|---|---|---|---|---|---|---|---|---|---|
| 75/01/15 | 14 | 10 | 0.080 | 1.000K | 0.050K | 0.050K | 0.205 | 2.780 | 2.800 |
| 75/05/02 | 13 | 45 | 0.150 | 1.100 | 0.050K | 0.100K | 0.100K | 2.780 | 2.800 |
| 75/05/29 | 10 | 30 | 0.150 | 1.400 | 0.120 | 0.093 | 0.100K | 3.000 | 3.000 |
| 75/06/09 | 14 | 55 | 0.150 | 0.500K | 0.050K | 0.100 | 0.100 | 3.070 | 2.760 |
| 75/07/02 | 13 | 00 | 0.100 | 1.900 | | 0.074 | 0.400 | 3.000 | 3.000 |
| 75/08/13 | 11 | 30 | 0.100 | 1.500 | 0.050K | 0.140 | 0.240 | 3.030 | 3.100 |
| 75/09/09 | 12 | 30 | 0.125 | 1.000 | 0.025K | 0.110 | 0.110 | 3.020 | 3.100 |
| 75/10/30 | 10 | 30 | 0.100 | 2.750 | 0.025K | 0.025K | 0.170 | 3.000 | 3.100 |
| 75/12/16 | 11 | 05 | 0.125 | 1.300 | 0.025K | 0.050 | 0.100K | 3.000 | 3.100 |

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/08/12

4903CA TF4903CA P001000
40 29 00.0 111 28 00.0 4
MIDWAY
49 7.5 HEBER
T/DEER CREEK RES.
SNAKE CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P | 50051 FLOW RATE INST MGD | 50053 CONDUIT FLOW-MGD MONTHLY |
|---|---|---|---|---|---|---|---|---|---|
| 75/01/15 | 13 | 10 | 2.400 | 9.000 | 0.080K | 2.500 | 3.800 | 0.240 | 0.194 |
| 75/04/10 | 11 | 30 | 4.200 | 3.600 | 0.088 | 2.300 | 2.800 | 0.162 | 0.180 |
| 75/05/02 | 12 | 10 | 4.400 | 5.500 | 0.083 | 3.300 | 5.000 | 0.170 | 0.180 |
| 75/05/29 | 09 | 30 | 5.400 | 6.900 | 0.120 | 1.750 | 2.600 | 0.190 | 0.250 |
| 75/06/04 | 14 | 15 | 5.250 | 5.600 | 0.050K | 1.900 | 3.900 | 0.260 | 0.370 |
| 75/07/02 | 09 | 30 | 4.200 | 10.500 | 0.075 | 1.450 | 3.100 | 0.500 | |
| 75/08/13 | 12 | 30 | 4.500 | 10.500 | 0.450 | 4.300 | 5.400 | 0.300 | 0.300 |
| 75/09/09 | 09 | 15 | 5.700 | 6.600 | 0.050 | 2.400 | 3.400 | 0.300 | 0.300 |
| 75/10/31 | 09 | 00 | 6.600 | 3.000 | 0.092 | 3.000 | 4.000 | 0.400 | 0.400 |
| 75/12/16 | 10 | 00 | 2.500 | 5.200 | 0.035 | 2.000 | 2.700 | 0.260 | 0.250 |

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/08/12

4903CB N04903CB P
40 29 00.0 111 28 00.0 4
MIDWAY FISH HAT.
49 7.5 HEBER
T/DEER CREEK RES.
SNAKE CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P | 50051 FLOW RATE INST MGD | 50053 CONDUIT FLOW-MGD MONTHLY |
|---|---|---|---|---|---|---|---|---|---|
| 75/01/15 | 13 | 20 | 0.720 | 1.000K | 0.050K | 0.089 | 0.100K | 11.300 | 11.000 |
| 75/04/10 | 11 | 35 | 0.700 | 0.500K | 0.050K | 0.130 | 0.200 | 14.700 | 12.700 |
| 75/05/02 | 12 | 30 | 0.700 | 0.500K | 0.060 | 0.095 | 0.100 | 15.000 | |
| 75/05/29 | 09 | 10 | 0.350 | 1.400 | 0.081 | 0.073 | 0.180 | 20.900 | |
| 75/06/09 | 14 | 00 | 0.350 | 0.500K | 0.050K | 0.071 | 0.100 | 26.[illegible]00 | 17.700 |
| 75/07/02 | 09 | 40 | 0.575 | 0.320 | 0.025K | 0.040 | 0.050K | 2[illegible].500 | |
| 75/08/13 | 12 | 45 | 0.575 | 0.900 | 0.055 | 0.050 | 0.100K | 25.300 | 28.000 |
| 75/09/09 | 09 | 30 | 0.575 | 0.885 | 0.025K | 0.069 | 0.100K | 18.600 | 23.500 |
| 75/10/30 | 08 | 50 | 0.650 | 1.400 | 0.025K | 0.063 | 0.280 | 18.500 | 22.500 |
| 75/12/16 | 10 | 00 | 0.775 | 1.800 | 0.025K | 0.062 | 0.100K | 18.500 | 22.500 |

K VALUE KNOWN TO BE
LESS THAN INDICATED

ARRIVAL DATE 75/08/12

4903FA TF4903FA P003000
40 30 26.0 111 26 26.0 4
HEBER CITY
49 7.5 HEBER CITY
T/DEER CREEK RES. 150791
SPRING CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P | 50051 FLOW RATE INST MGD | 50053 CONDUIT FLOW-MGD MONTHLY |
|---|---|---|---|---|---|---|---|---|---|
| 75/01/15 | 13 50 | | 0.720 | 18.000 | 3.150 | 4.300 | 6.400 | 0.800 | 1.100 |
| 75/04/10 | 12 00 | | 1.150 | 18.500 | 3.700 | 4.500 | 5.600 | 0.420 | 0.700 |
| 75/05/02 | 13 20 | | 1.450 | 17.500 | 1.250 | 5.300 | 7.500 | 0.500 | 0.470 |
| 75/05/29 | 10 00 | | 2.700 | 6.900 | 0.100 | 1.050 | 1.800 | 1.500 | 1.800 |
| 75/06/09 | 14 35 | | 3.000 | 6.000 | 0.140 | 0.860 | 1.850 | 3.990 | 1.300 |
| 75/07/02 | 13 05 | | 2.900 | 0.750 | 0.025K | 0.790 | 0.840 | 5.500 | |
| 75/08/13 | 12 00 | | 3.100 | 4.100 | 0.095 | 0.740 | 1.100 | 6.500 | 6.500 |
| 75/09/09 | 10 00 | | 2.750 | 1.600 | 0.025 | 0.690 | 1.200 | 6.500 | 6.500 |
| 75/10/30 | | | 2.800 | 11.000 | 0.375 | 2.200 | 3.500 | 0.400 | 0.400 |
| 75/12/16 | 10 40 | | 1.350 | 12.000 | 0.100 | 3.200 | 4.200 | 0.800 | 0.800 |

K VALUE KNOWN TO BE
LESS THAN INDICATED